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***Hydraulic Fracturing: Tolerate, Regulate or  
Litigate?***

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## **HYDRAULIC FRACTURING: TOLERATE, REGULATE OR LITGATE?**

### **I. INTRODUCTION**

Energy sector industry experts predict that hydraulic fracturing, aka “fracking” or “hydrofracking,” will provide the United States, among other countries, with the means to become more energy independent. Hydrofracking is the process used to extract oil and gas from shale rock deep within the earth. Although it is difficult to dispute that hydrofracking is making vast plays of otherwise inaccessible natural gas available, its effects on the environment, and the manner and extent by which it should be regulated, is being hotly contested. The media has focused its attention on this process that pits the economic advantages of natural gas extraction against human health and the environment.<sup>1</sup> Indeed the highly publicized consumer advocate Erin Brockovich has joined forces with the well-known plaintiffs’ law firm Weitz and Luxenberg to “fight for you” against contamination from the dangers of fracking.<sup>2</sup> Moreover, one need only travel the back roads of upstate New York or Northeast Pennsylvania to detect the apparent sentiments both for and against the development of shale gas through hydraulic fracturing.

Although natural gas provides about 25 percent of total U.S. energy, shale gas made up less than two percent of total U.S. natural gas production in 2001. Today it is approaching 30%.<sup>3</sup> Moreover, while natural gas production by hydraulic fracturing is currently banned in certain countries in Europe, increased interest in gas shale development is evident on an international basis by the significant investment in preliminary leasing activity in many parts of the world, including Eastern and Western Europe, Asia, Africa and South America.<sup>4</sup> It is estimated that recoverable shale gas reserves in those regions exceed 5,760 trillion cubic feet, as compared to 862 trillion cubic feet of recoverable shale gas reserves in the U.S.<sup>5</sup>

In the U.S., energy companies are being closely scrutinized regarding this process of natural gas extraction that is exploding in certain parts of the country. State and federal investigations are underway, new regulations are being promulgated, and lawsuits are being filed by property owners, environmentalists and others impacted by hydraulic fracturing.<sup>6</sup>

Although the majority of lawsuits alleging property damage or bodily injury have been to date filed in Pennsylvania, environmental advocacy groups link hydraulic fracturing to contamination in several states other than Pennsylvania including Wyoming, West Virginia, Texas, Louisiana, Arkansas, and Colorado.<sup>7</sup> Further, as the international interest in hydraulic fracturing and the need for gas production increases, it is likely that many countries will permit the process to go forward. There is therefore a growing concern that hydrofracking may not be strictly regulated in certain countries which may lead to fracking lawsuits on a global basis. This article discusses the hydraulic fracturing process, recent investigations and regulations relating to hydraulic fracturing, the current status of litigation relating to claims of bodily injury and property damage allegedly arising out of the process, and the probable liability coverage issues that may result from the anticipated litigation.

## **II. UNDERSTANDING THE HYDRAULIC FRACTURING PROCESS**

The use of horizontal drilling in conjunction with hydraulic fracturing has greatly expanded the ability of producers to profitably produce natural gas from shale formations. Hydraulic fracturing involves injecting water, sand and a cocktail of chemicals at high pressure into shale formations thousands of feet below the earth's surface to create fractures. The newly created fractures are "propped" open by the sand which allows the natural gas to be extracted. The process was first used in Oklahoma in 1949, and the first hydraulic fracturing of gas shale

formations began in the 1980s in the Barnett Shale in Texas. This process is used for the extraction of both natural gas and oil, and, to a lesser extent, for the extraction of steam for electricity generation (geothermal fracking).

Natural gas is an important energy source for the United States. Because shale formations represent a growing source of natural gas, they are among the busiest oil and gas plays in the country. There are a number of shale formations in the United States, including the Marcellus Shale, which extends from Southern New York through Pennsylvania and West Virginia; the Barnett Shale in Texas and Oklahoma; and the Fayetteville Shale in Arkansas, to name a few. Each has received much attention by lawmakers, environmentalists, and potential litigants

Horizontal wells are drilled vertically and then horizontally once the shale rock is reached. They are more expensive to drill, but allow for up to a mile of contact between the well and the shale rock, which provides for much larger gas production than vertical wells and easily outweighs the higher cost. When in place, the well is encased with a cement seal to prevent methane gas migration. Virtually no shale gas wells in the U.S. would be developed absent hydrofracking as the natural gas is trapped in the shale rock formation and can only be extracted from the shale by the fracking process.

The chemicals that make up the fracking fluid are cause for concern. They may include, among other chemicals, barium, strontium, benzene, glycol-ethers, toluene, 2-(2-methoxyethox) ethanol, and monylphenols. Although all have been linked to health disorders at high levels of exposure,<sup>8</sup> the oil and gas industry has firmly maintained that there is little risk of impact to ground water resulting from hydraulic fracturing in deep shale gas wells.<sup>9</sup> The industry has represented that the fracking mixture is made up of approximately 90% water, less than 10% sand and approximately 0.5% other ingredients, of which some are hazardous chemicals. Such

composition is hardly the “toxic soup” that plaintiffs’ attorneys have characterized fracking fluid to be. On 11 April 2011, the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission opened a new online system to host information about the chemical additives used in frac fluids and their ingredients. Although this registry, populated by gas companies, is strictly voluntary, information has been entered for over 400 wells across the country.<sup>10</sup>

A large amount of water is needed for the fracking process which may reduce the available water supply in certain areas. A single well may require 1 to 5 million gallons which must either be taken from the public water supply or trucked in or piped from ground or surface water. The energy industry argues that, when considering the amount of water that is used by other industrial processes, the amount used in hydrofracking is relatively small. However, use of relatively large amounts of water for this process can pose a problem in drought-prone states such as Texas where water is often scarce. For example, water use data in the Susquehanna Basin in central Pennsylvania indicates that the total water use from June 2008 to March 2011 for hydraulic fracturing was 1.6 billion gallons for 553 wells; 65% from surface water and 35% from the public water supply. Total water flowback was 117 million gallons for the same time period, 64% of which was reused.<sup>11</sup>

Moreover, the millions of gallons of wastewater from the hydraulic fracturing process may contain not only the chemicals that make up the fracking fluid, but also radioactive elements such as radium which can occur naturally thousands of feet underground. These elements may prove carcinogenic to those exposed at the surface. In February 2011, the New York Times reported that thousands of internal documents obtained from the U.S. Environmental Protection Agency (“EPA”), state regulators and drillers show that the dangers to the

environment and health are greater than previously understood.<sup>12</sup> The documents reveal that the wastewater, which is sometimes hauled to sewage plants not designed to treat it, and then discharged into rivers that supply drinking water, contains radioactivity at levels higher than previously shown, and far higher than the level that federal regulators deem safe for the treatment plants to handle. Other documents and interviews show that many EPA scientists are alarmed, warning that the drilling waste is a threat to drinking water in Pennsylvania. Their concern is based partly on a non-public 2009 study by an EPA consultant who concluded that some sewage treatment plants were incapable of removing certain drilling waste contaminants and were probably violating the law. The New York Times also found never-reported studies by the EPA and a confidential study by the drilling industry that each concluded that radioactivity in drilling waste cannot be fully diluted in rivers and other waterways.<sup>13</sup>

In order to alleviate the aforementioned threat, although not yet commonly used, the industry is trending to treatment systems that divert the wastewater to a closed loop system with tanks so that the wastewater may be treated and discharged, or treated and reused. It is predicted that these wastewater treatment systems will help to eliminate the potential for surface or ground water impacts.

There is no doubt that hydraulic fracturing of shale rock deposits is booming, especially in Pennsylvania where only 18 wells were drilled in the Marcellus Shale in 2007, compared to 1,454 wells in 2010.<sup>14</sup> In Pennsylvania, there are currently approximately 2,300 wells producing more than 3 billion cubic feet (“cf”) of natural gas per day. It is estimated that 84 trillion cf to 300 trillion cf of natural gas is recoverable. By 2020, it is estimated that the Marcellus Shale will provide 25% of the current U.S. natural gas demand. The natural gas boom has added over \$12

billion to the Pennsylvania Gross Domestic Product (“GDP”) and supports 156,000 jobs. Texas-based law firms are even moving into the area.<sup>15</sup>

Natural gas was first drilled in the Barnett Shale in 1981, where horizontal drilling and hydraulic fracturing was pioneered. There are currently 14,000 active wells producing 4.8 billion cf of natural gas per day. Similar to the effect of production from the Marcellus Shale, the extraction of natural gas from the Barnett Shale has stimulated the area’s economy.

Although currently banned in certain countries Europe, such as France, and subject to moratoriums in others, such as England, shale gas production will likely begin or increase in many countries in the next few years. The U.S. Department of Energy released a report in April 2011, that assessed 48 shale gas basins in 32 countries, containing almost 70 shale gas formations around the world, including Europe, China, South America, Mexico, and South Africa, to name a few.<sup>16</sup> The report concludes that worldwide recoverable gas resources currently approximate 16,000 trillion cf, exclusive of shale gas. By adding the identified shale gas resources to other gas resources, total worldwide recoverable gas resources will increase by over 40 percent to 22,600 trillion cf.<sup>17</sup>

The report indicates that active levels of shale gas leasing and exploration are already underway in France, Germany, the Netherlands, Sweden, Denmark, the United Kingdom, Austria, Poland and Bulgaria. Notwithstanding, in July 2001, the French Senate voted to ban the use of hydraulic fracturing and directed that companies to whom permits have been issued for exploration in southeast France disclaim the use of fracking.<sup>18</sup> Due to minor earthquakes and contamination concerns, the United Kingdom is considering placing a moratorium on the exploration, development and production of shale gas until a detailed environmental impact assessment is in place.<sup>19</sup>



According to the U.S. Department of Energy Report, Exxon Mobil has been the lead company leasing prospective shale gas acreage in Germany. In addition to five test wells drilled to date, in November 2010, Exxon announced an additional 10 well exploration program that will be targeting shale gas potential in northwest Germany.<sup>20</sup> Analysis of the environmental impact of hydraulic fracturing is underway in Germany, which has reportedly used the fracturing process since the 1960s.<sup>21</sup> In August 2011, Germany's Federal Environment Agency ("FEA") issued draft proposals for new mining laws, to ensure that producers assess the environmental impact of drilling each well and to ban hydraulic fracturing in areas where potable water is in use.<sup>22</sup> The German oil and gas producer association, WEG, opposed the need for tighter environmental impact assessment rules citing to several decades of experience with the use of fracturing technology. A report issued in June 2011 by the European Parliament was critical of the use of hydraulic fracturing to extract hydrocarbons from shale based on environmental and sustainability concerns.<sup>23</sup> The European Energy Commission is also assessing the impact of shale gas extraction and, if the process is condoned, will likely heavily regulate same throughout the European Union. It is Poland's position, where large shale plays have been explored, that the exploration and production of shale gas is sufficiently regulated. Poland will likely oppose any attempt by the European Union to implement regulations to limit shale gas development.<sup>24</sup>

It is reported that the China National Petroleum Company completed the first horizontal shale gas test well in March 2011, and is moving quickly to explore China's shale reserves in partnership with international gas producers such as Royal Dutch Shell and Chevron. China's resources could be some of the world's largest deposits. However, the Chinese Ministry of Environmental Protection has yet to study the potential environmental impacts.<sup>25</sup>

### **III. UNCONVENTIONAL NATURAL GAS DRILLING GENERATES REGULATION AND LITIGATION**

Currently, hydraulic fracturing is not under the jurisdiction of the USEPA, but may be regulated by state and local agencies. In 1997, the EPA undertook a study to evaluate the dangers of hydraulic fracturing. In 2004, it concluded: “based on the information collected and reviewed, EPA has concluded that the injection of hydraulic fracturing fluids into [coal bed methane] poses little or no threat to [underground sources of drinking water] and does not justify additional study at this time.”<sup>26</sup> The EPA conclusions were widely criticized. The New York Times said the conclusions “white-washed the industry” and were “politically motivated.”<sup>27</sup> Pursuant to the Energy Policy Act of 2005, the Safe Drinking Water Act (“SDWA”) was amended and the definition of “underground injection” was changed to exclude the underground injection of fluids or propping agents (other than diesel fuels) used in hydraulic fracturing operations.<sup>28</sup> This amendment is commonly referred to as the “Halliburton Loophole,” named after one of the leading companies performing hydraulic fracturing.

Today, federal regulators are taking a new look at fracking as gas drillers flock to the lucrative Marcellus Shale, the Barnett Shale, and other shale formations around the U.S.

#### **A. Federal Investigation and Regulation**

The Fracturing Responsibility and Awareness of Chemicals (FRAC) Act, introduced to the Committee on Environment and Public Works in June 2009, by Senator Robert Casey (D-PA), seeks to widen the definition of “underground injection” in the SDWA to include hydraulic fracturing. The Act, which remains in Committee, also seeks to require that anyone engaging in hydraulic fracturing disclose the chemical constituents (but not the proprietary chemical formulas) used in the fracturing process.

There were more than 493,000 active natural gas wells in the United States in 2009, almost double the number in 1990. According to the drilling industry, close to 90% of wells have been fractured to obtain more gas from the well.<sup>29</sup> In early 2010, at the urging of Congress, the EPA launched a long term scientific study of the effects of hydraulic fracturing on drinking water and public health, the initial results of which are not expected before late 2012. In February 2011, the EPA submitted its draft Hydraulic Fracturing Study Plan to the agency's Science Advisory Board for review.<sup>30</sup> In March 2011 technical workshops were held to collect more information to support the study. In June 2011, the EPA announced 7 study sites to be further analyzed, including the Marcellus and Barnett Shales. The EPA study is designed to examine the conditions that may be associated with the potential contamination of drinking water resources, and to identify the factors that may lead to human exposure and risks. Although the EPA study will examine the safety of the hydraulic fracturing technique, it does not guarantee that the federal government will step in and regulate the technique. Further, the EPA study will only evaluate the possible impacts of hydraulic fracturing processes on drinking water resources as part of the fracking process, e.g. from water acquisition, chemical mixing, well injection, flowback water and wastewater. The EPA study will not examine the potential impact to air quality, ecosystems, the economy or occupations.

In May 2011, U.S. Energy Secretary Steven Chu charged the Secretary of Energy Advisory Board ("SEAB") Natural Gas Subcommittee ("Subcommittee") to make recommendations to improve the safety and environmental performance of natural gas hydraulic fracturing from shale formations. The Subcommittee is composed of seven individuals from the government, academia and the public sectors whose conclusions will likely be based more on public policy than science. In the short term, the panel is to identify immediate steps that can be

taken to improve the safety and environmental performance of fracking. The SEAB Shale Gas Production Subcommittee 90-Day Report dated 18 August 2011, includes the following findings and recommendations: improve public information about shale gas operations, improve communication among state and federal regulators, improve air quality, protection of water quality, disclosure of fracturing fluid composition and other recommendations.<sup>31</sup> By November 2011 the SEAB is to develop consensus recommended advice to various agencies on practices for shale gas extraction to ensure the protection of public health and the environment.

The House Energy and Commerce Committee has requested that some of the nation's biggest oil and gas service companies supply data on chemicals used in the drilling process. They also requested information about the disposal of the tainted fluid after it is pumped back out of the ground, among other issues.<sup>32</sup> However, likely because not yet compelled by law, only limited natural gas companies have volunteered the information as companies participating in hydraulic fracturing are reluctant to provide information concerning the chemicals used in the process citing trade secret confidentiality.<sup>33</sup>

The recent publicity of the potential risks associated with fracking has given regulators a platform for pushing ahead with further federal regulation of air standards as well. For example, in July 2011, the USEPA proposed New Source Performance Standards ("NSPS") that would be the first federal air standards for wells that are hydraulically fractured. Existing NSPS covers natural gas processing plants. However, the new changes would apply to well completions, compressors, controllers and storage vessels.

## **B. State/Local Investigation/Regulation**

There have been recent developments on the state and local levels to promote, regulate, and in certain instances outright ban, hydraulic fracturing. Fracking is causing a showdown of competing interests: supporting the economic needs of a region and our nation's need to secure energy reserves versus protecting the environment. Because certain regulations are stalled at the federal level, states are implementing their own regulations, often through water management programs and drilling management programs.

Pennsylvania has the most stringent regulations in the nation. It passed the Water Resources Planning Act which requires registering with the state in the event of a withdrawal from a watershed of 50,000 gallons of water per day over a 30 day period.<sup>34</sup> This regulation will necessarily apply to those companies involved in hydraulic fracturing. Pennsylvania's Oil and Gas Act<sup>35</sup> provides for strict drilling standards that require baseline ground water monitoring in the event of a future impact, delayed and prescriptive cementing and casing requirements of gas wells, and completion reports requiring disclosure of chemicals and additives used, sources of water, total volume fluid, and volume of recycled water. Pennsylvania issued 1,200 violations in 2010, requiring gas companies to pay for clean-up of spills, leaks and gas migration.

In preparation for drilling of the Utica Shale play, which underlies the Marcellus Shale, and is next in line to be exploited, the State of Ohio has enacted stringent regulations concerning registration, detailed well construction, casing and cementing records, and records concerning the type and volume of stimulation fluids and fluid management. Texas, West Virginia and other states also have improved water management and drilling practices regulations.

In December 2010, the Delaware River Basin Commission ("DRBC"), a federal-interstate agency comprised of representatives from Delaware, New Jersey, New York,

Pennsylvania and the US Army Corps of Engineers, posted for public comment its first set of proposed regulations governing natural gas development projects within the Delaware River Basin (the “Basin”), with a specific focus on hydraulic fracturing.<sup>36</sup> If approved, the proposed regulations would require greater chemical information disclosure and financial assurance requirements from oil and natural gas companies. Moreover, the regulations would end the moratorium on natural gas development within the Delaware River Basin that has existed since June 2008. The Delaware River Basin provides drinking water to 5% of the country’s population. These regulations are generally viewed as indicative of the DRBC’s pro-development stance. Public hearing sessions commenced in February 2011.

In May 2011, the State of New York filed a lawsuit in the U.S. District Court for the Eastern District of New York against various federal agencies including the U.S. Army Corp. of Engineers, U.S. Fish and Wildlife Service, U.S. Department of the Interior, and other agencies seeking compliance with the National Environmental Policy Act of 1969 (“NEPA”). New York asserts that NEPA requires that a draft environmental impact statement be prepared and made available for public comment before proceeding to adopt the proposed DRBC regulations that would authorize natural gas development within the Delaware River Basin.<sup>37</sup>

The Marcellus Shale in Pennsylvania has moved to the forefront on a number of issues with regard to hydraulic fracturing. The New York Times reported that drillers trucked at least half of the waste from the wells to public sewage treatment plants in Pennsylvania in 2008 and 2009, and some has been sent to other states including New York and West Virginia.<sup>38</sup> Most of these facilities are not equipped to remove enough of the radioactive materials present in the water to meet federal drinking water standards prior to discharging the wastewater into rivers and threatening the area’s drinking water supply.

In 2009, the Pennsylvania Department of Environmental Protection (“PA DEP”) began investigating complaints of natural gas in water supplies by Dimock Township residents and an explosion of a water well in a resident’s yard. PA DEP inspectors discovered that well casings on some of Cabot Oil & Gas Corp.’s natural gas wells were cemented improperly or insufficiently, allowing methane gas to migrate to ground water. The PA DEP issued a report in November 2009, stating that the homes of residents in Dimock, Pennsylvania, had been contaminated by eight natural gas wells that caused methane to spew into the local aquifer. Cabot was ordered to pay fines and agreed, in December 2010, to pay \$4.1 million to 19 homeowners whose private wells were contaminated by methane gas migrating from the drilling site.<sup>39</sup> Cabot also agreed to provide treatment systems for the homeowners’ wells and to reimburse the DEP \$500,000 for investigation costs.

Other investigations by the PA DEP include a Marcellus Shale natural gas well control incident in Tioga County in January 2011, located on state forest land. During the incident, fracking fluids and sand were discharged from the well into the air.<sup>40</sup> In a separate investigation, the PA DEP released a report on a four-week air quality study conducted near Marcellus Shale gas operations in Susquehanna and Sullivan Counties that showed “no emission levels that would constitute a concern to the health of residents living near these operations.”<sup>41</sup>

New York is also grappling with the issue of regulation of hydraulic fracturing. On 11 December 2010, Governor David Patterson of New York vetoed a six-month moratorium on hydraulic fracturing passed by the New York Legislature<sup>42</sup> citing the loss of jobs and the economic investment that would result from the bill. Instead, as part of a compromise, the Governor issued a more narrow Executive Order that defers the issuance of any permits for only high-volume, horizontal hydraulic fracturing until the completion of the New York State

Department of Environmental Conservation's Supplemental Generic Environmental Impact Statement which is currently out for comment until October 2012. The DEC report concludes that only hydraulic fracturing operations within the New York City and Syracuse watersheds pose significant adverse impacts to water resources and recommends banning hydrofracking in those areas, as well as within 500 feet from any public water supply or private well. This recommendation would leave at least 80% of New York State's gas reserves open for drilling. It is expected that New York will likely begin gas drilling in the Marcellus Shale area in 2012, excluding the abovementioned banned areas.

New Jersey became the first state in the nation to pass a bill to enforce a statewide ban on hydraulic fracturing.<sup>43</sup>

Morgantown City Council, in West Virginia passed an ordinance prohibiting the use of hydraulic fracturing in horizontal drilling within one mile of the city limits, which was immediately successfully challenged by a lawsuit filed by Northeast Natural Energy on constitutionality grounds.<sup>44</sup>

The South and Western regions in the United States have addressed the issue of disclosure of chemicals used in the process. As of September 2010, Wyoming requires the disclosure of chemicals used in fracking fluids. Wyoming's disclosure rule, approved despite opposition from the industry based on allegations of proprietary information, requires that companies disclose chemicals used in oil and gas drilling, fracking and other drilling operations.<sup>45</sup> Similarly, in May 2011, the Texas House of Representatives passed a bill requiring natural gas drillers to publicly disclose the chemicals they use in hydraulic fracturing.<sup>46</sup>

On 12 December 2010, Arkansas' Oil and Gas Commission adopted a proposed rule requiring the disclosure of the constituents of hydraulic fracturing which took effect in January



2011. The change in regulation stems from seismic activity possibly induced by well activities around the town of Enola in Faulkner County, Arkansas. The Commission granted the moratorium on disposal wells. During the moratorium period, the Arkansas Geological Survey, the Arkansas Oil and Gas Commission, United States Geological Survey, and the Center for Earthquake Research and Information will study whether disposal wells can have some effect on seismic activity in the area. The oil and gas industry uses disposal wells to inject used drilling fluids deep into the earth so that fluids cannot migrate into fresh water aquifers or the biosphere.<sup>47</sup>

In a largely symbolic gesture, the cities of Buffalo, New York and Pittsburgh, Pennsylvania have banned the gas drilling technique of hydraulic fracturing, as well as the storing, transferring, treating or disposing of fracking waste within those cities. No such drilling project had been planned for the cities; however, officials were concerned that fracking waste from nearby operations may reach the cities' sewer systems.<sup>48</sup>

It seems certain that the natural gas industry in the U.S. will continue to move forward with the hydraulic fracturing technique, although it will likely be subject to stricter regulation. The outlook for shale gas extraction using this technique in Europe appears uncertain due to concerns about the environment and the disruption of densely populated communities.<sup>49</sup> However, the estimates of global shale gas formations set forth in the recently released U.S. Department of Energy report, and the world's hunger for new energy sources, may give renewed life to hydraulic fracturing on a worldwide basis.

Any uncertainties that may exist with regard to natural gas extraction in the U.S. do not appear to have deterred foreign investment in the industry. BHP Billiton, an Anglo/Australian resource company, recently struck a deal to purchase Arkansas shale gas reserves from

Chesapeake Energy Corp. for \$4.75 billion. The deal pits BHP head-to-head against China in a race for global energy assets. It follows state-owned PetroChina's \$5.5 billion agreement to buy shale gas stakes from Canada's largest gas producer, Encana Corp. in early February 2011.<sup>50</sup>

#### **IV. LITIGATION LOOMS**

The foreseeable impacts of hydraulic fracturing to the public are numerous and range from the impact on water from drilling/wastewater (wells, streams, withdrawals), operations problems/accidents (spills, leaks, fires, blowouts), gas migration, air impacts, and disclosure of chemicals in fracking fluids. There are currently over 30 private lawsuits alleging property damage, bodily injuries, emotional distress, fear of cancer or economic loss related to the hydrofracking process.

An attack of litigation on multiple fronts is predicted by the plaintiffs' bar including suits alleging; personal injury/property damage, medical monitoring class actions, consumer fraud non-injury class actions, government investigations/litigations and securities fraud class actions. The categories of claims may include methane gas migration, ground water contamination, air emissions and explosion. The conduct challenged stems from well construction (improper design/negligent construction); spills; containment (i.e. holding ponds); and explosions. Legal theories include common law public/private nuisance, trespass, negligence, strict liability, fraudulent misrepresentation, and statutory violations of the Clean Water Act, Clean Air Act, Safe Drinking Water Act, state and federal hazardous waste laws and state regulations related to oil and gas production. Damages sought include compensatory, medical monitoring, injunctive relief and punitive damages.

The most credible cases filed thus far relate to allegations of methane migration. In certain cases hydraulic fracturing or associated activities are alleged to have resulted in the

release of methane onto plaintiffs' land and into ground water and wells. Many of these cases allege negligence in the construction of the wells. The major issue with methane migration cases is causation, i.e. determining the source of the methane. Was the methane migration caused by hydraulic fracturing or by naturally occurring methane? Although methane migration cases may allege bodily injury or at least the need for medical monitoring, the hard damages involve property, i.e. costs for public water, risk of explosion, stigma, remediation and diminished property value. As discussed above, the Dimock Township investigation that found that methane contaminated a local aquifer, resulted in Cabot's agreement to pay over \$4 million to 19 homeowners.

The increase of methane concentration in ground water close to fracking operations is further supported by a May 2011 Duke University study that concluded that methane concentrations were 17 times higher in the ground water of 51 out of 60 wells located in Northeast Pennsylvania and upstate New York that were located within a kilometer of active hydrofracking sites, as opposed to wells located outside that area.<sup>51</sup> The study concluded that although dissolved methane in drinking water is not currently classified as a health hazard for ingestion, it is an asphyxiant in enclosed spaces and creates a risk of explosion and fire hazard. Notably, the study found no evidence of contamination from chemical-containing fracking fluids injected into the wells, or from "produced water," wastewater that is extracted back out of the wells after the shale has been fractured.

Although the fracturing occurs thousands of feet below the aquifer, some plaintiffs assert that the high pressure fracturing process can cause the allegedly hazardous fracturing fluid constituents to migrate to groundwater or surface water, possibly through other abandoned wells

in the area. However, there are no known cases where it has been established that the fracking fluid caused ground water contamination.

There have been lawsuits filed asserting contamination/property damage and/or bodily injury resulting from the practice of hydraulic fracturing in state and/or federal courts in Pennsylvania, New York, Colorado, Arkansas, West Virginia, and Texas, only a few of which will be discussed herein.

A fracturing lawsuit filed in September 2010, on behalf of thirteen Susquehanna County, Pennsylvania families claims that a nearby gas well has contaminated the water wells they rely on for drinking, bathing, cooking and washing. The lawsuit names Southwest Energy Production Company, a Houston, Texas-based gas drilling firm as well as its parent, Southwestern Energy Company.<sup>52</sup> The lawsuit alleges that the families have been, and continue to be, exposed to hazardous chemicals, including barium, manganese and strontium. One individual is alleged to have become physically ill, and exhibits neurological symptoms consistent with toxic exposure to heavy metals. The other families live in constant fear of future physical illness, particularly with respect to the health of their minor children and grandchildren. Southwest Energy began hydraulic fracturing operations near where the plaintiffs reside in 2008. The complaint charges that the defendant was negligent in the drilling, construction and operation of the well which allowed pollutants, including fracking fluid, to be discharged into the ground or into the waters near plaintiffs' homes and water wells. Following motion practice in February 2011, the judge refused to dismiss the count of the complaint asserting strict liability, concluding that the determination of whether an activity is abnormally dangerous is a fact-intensive inquiry to be considered when discovery is completed. The ruling leaves open the possibility that strict liability will be imposed for shale gas fracking operations in Pennsylvania.

According to the plaintiffs' attorneys, for the past two years, gas drillers have been descending upon Pennsylvania, anxious to tap the vast natural gas resources in the state's Marcellus Shale. Since 2008, the Pennsylvania Department of Environmental Protection has issued over 3,800 Marcellus Shale well permits. In the same time period, drillers have been cited for over 1,400 violations. Of those, 952 were identified as having or likely to have an impact on the environment, including violations of the state Clean Stream Law, improper construction of wastewater impoundments, poor erosion and sedimentation plans and the discharging of industrial waste.<sup>53</sup>

On 11 February 2011, nine homeowners filed a complaint against a Denver-based natural gas driller Anschutz Exploration Corp. ("Anschutz"), and its subcontractors, in Chemung County, New York, in what has been pleaded as the first hydraulic fracturing lawsuit filed in New York.<sup>54</sup> Plaintiffs claim that the companies were negligent in their drilling, construction and operation of two gas wells and that the companies' actions resulted in the contamination of drinking water with gas and silt. A spokesperson for Anschutz responded by stating that fracking was not used in the Anschutz drilling operation and that the Trenton Black River natural gas reserve, where the drilling occurred, is a limestone deposit, not a shale deposit. Anschutz described the filing as "an act of financial extortion by a self-serving group of lawyers who want to give themselves a massive payday."<sup>55</sup> Anschutz asserts that there is absolutely no evidence that activities of Anschutz caused water quality problems and that shallow, naturally occurring methane has been evident in the region for decades, predating the drilling of any natural gas wells in region.<sup>56</sup>

Other lawsuits have been filed in Bradford County, Pennsylvania, asserting contamination by the conduct of defendant gas companies that allegedly caused releases, spills,

and discharges of combustible gases, hazardous chemicals and industrial waste from their oil and gas drilling facilities. Damage to natural resources and contamination to the drinking water supply are alleged.<sup>57</sup>

A series of suits have been filed in Arkansas against BHP Billiton Petroleum LLC, and other gas companies alleging that recent earthquakes in central Arkansas, all occurring in the vicinity of defendant's injection wells, were caused by oil and gas drilling operations in the Fayetteville Shale. Plaintiffs allege that defendants' actions caused the price and deductibles for earthquake insurance to soar as well as detrimentally impacted property values. Trial is set for March 2012.<sup>58</sup>

Another set of lawsuits was initiated in May 2011, in the U.S. District Court for the Eastern District of Arkansas against Southwest Energy and other gas companies, including BHP Billiton. The suits allege the creation of noxious and harmful nuisance, contamination, trespass and diminution of property values caused by gas extraction operations in the Fayetteville Shale. The cases also allege contamination of soil, ground water and well water by methane and hydrogen sulfide.<sup>59</sup>

It is also predicted that hydraulic fracturing will induce shareholder investor lawsuits. Investors have recently filed shareholder resolutions asking several major oil and gas companies to disclose the environmental and financial risks associated with expanding natural gas hydraulic fracturing operations in the United States as well as the companies' strategies for mitigating those risks. Shareholder groups assert that poor well construction can lead to drinking water contamination, explosions and gas leaks. Among companies that have received the shareholder resolutions are: Anadarko Petroleum Corp., Cabot Oil & Gas Corp., Carrizo Oil & Gas, Inc., Chevron Corp., and ExxonMobil Corp. The resolutions also request that the companies recycle

and reuse wastewater, reduce the volume and toxicity of chemicals, disclose the chemicals used in fracturing operations, and insure the integrity of well cementing through pressure testing and other methods.

Similarly, in August 2011, the New York Attorney General issued subpoenas to three large exploration and production energy companies seeking information relating to those companies' disclosures of prospects for their natural gas wells to investors. The New York Attorney General has broad power to subpoena documents from businesses operating in the state and did so because New York State has more than \$45 million of its pension money invested with the subpoenaed energy companies.<sup>60</sup>

## **V. POTENTIAL COVERAGE ISSUES AND COVERAGE LITIGATION**

The issues and concerns raised by hydraulic fracturing range from bodily injury and property damage caused by various environmental contamination, to the alteration of the underground and surface geology. Legislative and regulatory directives setting standards for practice may prompt litigation in the form of environmental enforcement and private actions asserting noncompliance with federal, state or local water management standards. As stated above, the practice of hydraulic fracturing may likewise induce shareholder investor lawsuits against directors and officers.

Allegations of bodily injury and property damage resulting from hydraulic fracturing have caused the reappearance of some of the same plaintiffs' law firms, such as Baron & Budd and Weitz & Luxenburg, who have spearheaded years of litigation regarding environmental contamination, asbestos and other toxic tort claims. Lawsuits have been filed alleging bodily injury and property damage, and, although the gas drilling companies appear to be the targets of those lawsuits, smaller operators and public entities are also named. These large energy

companies are those that managed and/or conducted the hydraulic fracturing operations. Smaller companies may include subcontractors at the site, or manufacturers or distributors of failed parts of the drilling machinery. These companies will likely turn to their commercial liability insurers for coverage for the defense and indemnity of fracking claims.

The liability of the energy companies with regard to the hydraulic fracturing lawsuits remains to be seen as the science has not connected the fracturing process with actual ground water or other contamination. However, methane migration, injuries from explosion, and other incidents pose real liabilities for those involved in the drilling process. The potential cost to defend these suits, and to possibly make indemnity payments, is substantial. To date, no coverage lawsuits have been filed. However, insurers are closely watching the scope of the likely litigation as well as assessing the potential exposure of policyholder claims for coverage for a myriad of claims relating to hydraulic fracturing.

Certain policyholder attorneys have already compared this anticipated litigation to the “Superfund” litigation of the 1980s in which thousands of contaminated sites across the country were cleaned up at a very substantial cost. Although commercial liability insurers raised a number of coverage issues related to the environmental clean-up claims, at the end of the day, hundreds of millions of dollars were paid by liability insurers for defense, judgments and/or settlements.

Although commercial general liability coverage is likely part of a large gas company’s portfolio of coverage, the exposure to general liability policies is questionable. Oil and gas companies may have several different coverages more directly at stake with regard to fracking, such as specialty drilling policies, property policies, and environmental liability coverage. However, certain policies’ provisions may bar coverage under those policies based on the



individual facts of the claim, in which case general liability policies may be called upon to respond. Further, it is likely that smaller operators, whose main business may not be gas drilling, will not have specialty policies in place and will seek coverage for hydraulic fracturing related claims under the “property damage liability” or “bodily injury liability” coverage grants of their commercial general liability (“CGL”) insurance policies.

First party property policies, environmental liability policies and specialty drilling policies will also have various provisions and exclusions that will raise coverage issues with regard to fracking claims.

Large energy companies will look to their directors and officers (“D&O”) liability insurance policies to respond to shareholder investor lawsuits and investigations. However, based on the language of the policy, a number of exclusions or defenses may apply.

## **VI. CONCLUSION**

The use of hydraulic fracturing is providing access to global shale gas reserves never imagined only a few years ago. Because of this, natural gas production is increasing and the U.S. is leading the way, not only in production of shale gas by use of fracking but in regulation and litigation relating to the process as well. Insurers are closely monitoring fracking activities, the federal and state investigation and regulations, litigation and the potential coverage implications raised by this controversial, but lucrative, process.

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<sup>14</sup> [http://www.dep.state.pa.us/dep/deputate/minres/oilgas/new\\_forms/marcellus/marcellus.htm](http://www.dep.state.pa.us/dep/deputate/minres/oilgas/new_forms/marcellus/marcellus.htm)

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